



Journal of Vernon Bailey

U. S. Department of Agriculture

Washington D. C.

1908.

July 25 Left Washington on B & O.  
for Chicago and New Mex. at  
5:30 P.M.

July 26 Reached Chicago at 5 P.M.  
and left on Santa Fe Limited  
at 8 P.M. for Albuquerque N.M.

July 27 - Reached Kansas City at  
9 A.M. and Dodge City about  
dark. The real short grass  
arid plains begin just west of  
Dodge City.



## Albuquerque

July 28 - Reached Las Vegas at  
6:30 AM & Albuquerque at  
12:20 P.M.

Got a horse and drove across  
Rio Grande onto mesa west of river  
and then back and onto mesa east  
of town, and around the farms  
along river valley on both sides.  
Found no plant or bird or animal  
to indicate a trace of Lower Sonoran.

Found no good fruit, only scrubby  
apples and peaches and metesines  
and little red plums. Hunted in  
fruit stores and found no good  
fruit except imported. There are said  
to be some good ranches farther  
down the valley but none here.

Trees in town are mainly cottonwoods,  
boxelds, tamarisk, and peach & apple.  
Tamarisk grows in great profusion.  
A few Butterfly peas (*Parkinsonia aculeata*)  
are in blossom in yards.

The native plants are -

<u>Populus fremonti</u>	abundant along flats
<u>Salix</u>	(narrow leaf) " "
"	(yellow willow) " "



## Albuquerque

- ✓ Sarcobatus vermiculatus, abundant on flats
- ✓ Atriplex canescens " "
- ✓ Euphorbia \* big " "
- ✓ Lycium pallidum seen before striking Rio Grande on creek flat
- ✓ Lycium green, ~~same~~ with pallidum before striking Rio Grande.
- ✓ Forestiera - Common along creek before we struck Rio Grande.
- ✓ Bigelovia canescens (big) common along creek down Apache Canyon.
- ✓ Chrysothamnus - (green & leafless) abundant over mesa and edge of valley flats
- ✓ Chrysothamnus? (big coarse shrub) abundant on flats & salt ground. same as found at Laguna & along Puerco.
- ✓ Gutierrezia - The most abundant plant over mesa on east side of valley.
- ✓ Baccharis ~~?~~ Abundant on flats on salt ground.
- ✓ Suaeda douglasii, seen here & there over valley.
- ✓ Chrysothamnus grandiflorus, A little seen here & there.
- ✓ Helianthus annuus, abundant & big.
- ✓ Dalia canescens? The dominant plant on middle mesa section of both sides of valley.

## Albuquerque

- ✓ Amarobas? (big) along ditches  
in edge of town, looks like mesquite.
- ✓ Glycyrrhiza lepidota? com on flats.
- ✓ Croton texensis abundant on dry sandy plains
- ✓ Cleome integrifolia? " " "
- ✓ Yucca glauca com on mesas
- ✓ Opuntia clavata? " "
- ✓ Heliopsis scabra obs. on flat
- ✓ Arenaria (big white) " "
- ✓ Solanum rostratum com.
- ✓ " blue "
- ✓ Xanthium "

## Trees in Albuquerque

- ✓ <sup>P. fremontii</sup> Cottonwood abu.
- ✓ <sup>Boxelder</sup> Boxelder com.
- Ailanthus "
- Catalpa "
- Morus "
- Tamarisk abu. & very thrifty.



To Mountainair

July 29 Left Albuquerque at 7 A.M.  
for ~~Belen~~ and Mountainair on the  
Santa Fe Cut off. About 10 miles  
below Albuquerque and 2 miles before  
reaching Lolita on east side of river  
5 small bushes of dwarf Prosopis  
glandulose were seen on dry ledge  
of mesa, just below Belen on  
east side of river valley 2 more small  
bushes were seen and in the  
foothills of the Manzano Mts. considerably  
dwarf ~~Prosopis glandulosa~~ mesquite was seen on hot slopes  
in gulches. Just above and just  
below Belen a few scattered bushes  
of Prosopis ~~pubescens~~ pubescens were seen on  
wet bottom land, but only a few in  
these two spots. No other change  
in the valley flora was noted except  
a long strip of half tree yuccas 3 to  
4 feet high that suggest Cadirosa?  
near Becker Station, about the middle  
of the mesa east of the river.  
The strip is narrow, half a mile or so  
wide, but extends out of sight north  
south. As yet there is nothing  
on which to map Lower Sonoran.



After crossing a wide grassy plain  
We entered the west foothills of the  
Manzano Mts. at 5500 feet and  
there struck Juniperus monosperma,  
Yucca baccata, Molina  
Opuntia arborescens, Astragalus  
and a little farther up at 5700 feet  
Pinus edulis monophylla. Thence on to  
Mountainair the whole country is covered  
with Juniper and nut pines as far  
as you can see on all sides.  
A few little Mexican ranches are  
scattered along. Mountainair is at  
the summit and is said to be 6600 feet.  
It is about 15 miles east of the  
Manzano Mts.

Got a horse & buggy & started  
after dinner for a saw mill in  
the Manzano Mts. to stay all  
night and climb the peaks and come  
back tomorrow - Drove through  
beautiful Juniper & nut pine country  
about 10 miles, to where the yellow pines  
and oaks & checkerboarded Junipers  
begin at 7000 feet. Then on to  
Spencer's Saw Mill (Eastview) at 7400 feet  
then a mile & a half toward west to Dennis Mill  
at 7700 feet & staid all night.

## Canadian zone plants. Manzanito Mts.

<u>Abies concolor</u>	- abn.	8000 - 9600 N.E.
<u>Pseudotsuga douglasii</u>	"	8400 - 10000 "
<u>Pinus flexilis</u>	com	9000 - " "
<u>Populus tremuloides</u>	abn	8000 - " "
<u>Acer glabrum</u>	com	" - " "
<u>Robinia neomexicana</u>	"	7800 - 9700 "
<u>Salix</u>	big.	" 9000 - 10000
<u>Sambucus glauca</u>	"	" - " "
<u>Holodiscus</u>	"	" - " "
<u>Opulacis</u>	"	8000 - " "
<u>Delphinium</u>	big blue	" 9000 - " "
<u>Polemonium</u>	"	" - " "

## Transition Zone plants.

<u>Pinus ponderosa</u>	abn.	7000 - 8000 N.E. to 9000 SW.
<u>Quercus gambeli</u>	"	" - 9600
<u>Juniperus pachyphloea</u>	"	" - 8000
<u>Berberis ripens</u>		7800 - 8000
<u>Ceanothus</u>	"	" - "
<u>Pentstemon barbatus</u>		7000 - "
<u>Castilleja</u>	"	" - "

## Manzanito Mts.

July 30, Got up early & started up the hill. at 5. Leaving Gunn's mill I followed a lumber road N.W. up the gulch through open yellow pine timber about 2 miles to narrow part of gulch where Abies concolor, Populus tremuloides and Acer glabrum begin on the cold slope at 8000 feet. On hot slopes they begin at about 9000. The first Pseudotsuga douglasii taxifolia douglasii spruces were seen at 8400 feet and they reach the top of the peaks at 10000 while Abies concolor stops some 400 feet short of the top. It rained and was cloudy or foggy all the time I was on the Mts. so I could not see far, but went up a peak said to be as high or almost as high as any. The aneroid read 10000 feet on top, 9600 feet on top of main ridge. The east slope is heavily timbered with Abies concolor spruces, Abies concolor, Pinus flexilis & aspen. Deep where fire has swept over & thickets of Quercus gambeli oak have come up. There are many springs and a small creek in the gulch we went up. Grass & weeds are luxuriant.



## Manzano Mts

Mr. John Lee, who is working for the mill co. & has been Forest ranger, says there is no timber of value on the Manzano Nat. Forest, that all the good timber is owned by lumber co's.

Sitllers are coming into the juniper country and starting farms & some have good crops.

The old Apple trees at Manzano are said to be over a 100 years old & very large, but the apples are little & poor, evidently ungrafted seedlings.

Few mammals were seen.

- ✓ Cynomys ludovicianus were common near East View
- ✓ Neotoma albigula? Woodrat houses were numerous in the juniper country.
- ✓ Odocoileus hemionus - Mule deer are said to be common in the mts.
- ✓ Antilocapra There are said to be still lots of antelope on the plains east of the Manzanos. A man was arrested with 3 that he had killed recently.
- ✓ Ursus Black & brown bears are still common in the Manzanos.



## San Marcial Plants

Populus wislizeni, abundant on river flats

Salix narrow leaf " "

" wide leaf " "

Prosopis pubescens, screwbeans are common over bottom lands, often in thickets.

Prosopis glandulosa - common along edge of river valley and up the washes as far as I went - to 17 miles west. Usually low and in wide bunches.

Pluchea borealis, common in places on the flats.

Rhus microphylla - " in washes and along edge of valley. Extends back to 17 miles.

Chilopsis linearis, a few in lower washes.

Covillea tridentata, abundant on lower mesas and hot slopes back 4 to 10 miles.

After the dominant plant for miles some still on hot slopes at 17 miles west.

Lycium brachystachyum? common in washes & on mesa.

Sarcobatus glutinosus - common over mesa

Baccharis glutinosa - common along the flats plateau.

Ephedra tripartita (big guy) common in the washes and on mesa.

Ephedra (low blue) a little on mesa.

Fallugia parvifolia, common in washes.

## San Marcial

July 31. Came from Mountainair in the night & woke up at San Marcial. Got a horse & buggy and drove west to get into the San Mateo range but could not make it in one day. Went near enough to see the timber on this & a passage to the south of it and on the Mesquitas. Went about 19 miles on the Rosedale road & then turned back. The mts are not high enough for Canadian but the tall yellow pines begin about half way up and go to the tops of all 3 ranges. Nut pines & juniper cover the lower slopes and foothills.

Lower Sovereign Gorge is strongly marked along the Rio Grande valley & back on the lower mesas about 8 or 10 miles west of the river. It follows up large washes on the hot slopes to 17 miles west on the Rosedale Road.

On the river flats the dominant plants are <sup>Populus tremula</sup> Cottonwood, <sup>Prosopis pubescens</sup> screwbean, <sup>P. glandulosa</sup> mesquite, <sup>Pluchea borealis</sup> Pluchea breaks, and <sup>Rhus microphylla</sup>.



## San Marcial

- ✓ Yucca radiosa? (low) Com. over mesa & in washes.
- ✓ Yucca baccata (large) com on mesa back 10 miles mostly beyond Creosote bush.
- ✓ Opuntia engelmannii? a few small plants seen that seem to be this form.
- ✓ Opuntia longimantus (long bran spines) com on mesa
- ✓ " adpressus com on mesa, mainly on cold slopes or farther back.
- ✓ " clavatum, abundant on hot mesas.
- ✓ " (white spined) com. upper Sonoran
- ✓ " (fine spines) " " "
- ✓ Quercus grisea, a few on mesa 19 miles west.

## Mammals

- ✓ Citellus pilosus, many heard
- ✓ Neotoma micropus, houses numerous
- ✓ Perodipus burrows "
- ✓ Dipodomys spectabilis, Mounds numerous on mesa, first seen about 6 mi. back, not many with Creosote bush.
- ✓ Lepus texianus com
- ✓ " minor "
- ✓ Thomomys big mounds com in valley,
- ✓ " little hills scattered on mesa.

## San Marcial

Covillea tridentata  
on the lower mesas Creosote, Lycium, Baccharis glutinosa, green and blue Ephedra, Yucca between radiosa & glauca, and Gutierrezia are the abundant shrubs. There are several species of cactus. The Creosote keeps on hot slopes and avoids the local cold slopes, down to the valley. It also thins out on the mesa at 10 miles back and follows only tongues of south slopes, but follows some of these back 17 miles.

The Rogers Ranch in a big wash 17 miles NW. of San Marcial is the only inhabited place seen out of the river valley, but back in the foothills are lots of ranches & towns. There is a little grass over the mesa & a few horses.

Farming along the Rio Grande valley is of the Mexican type, little weedy patches & scrubby except apple and peach trees. The only fruit I could find was both hard and apples.



## San Marcial Birds

<u>Zenaidura macroura</u>	com.	316
<u>Callipepla squamata</u>	com on all across mesa.	293
<u>Buteo b. calurus</u>	several seen on mesa	337b
<u>Falco s. phaeura</u>	one seen on mesa.	306a
<u>Cathartes aura</u>	" " "	35
<u>Dryobates s. bairdi</u>	one heard in wash near town.	396
<u>Tyrannus vociferans</u>	com. on mesa.	448
<u>Colaptes siculus</u>	seen feeding young in town.	462
<u>Geococcyx</u>	several seen on mesa.	385
<u>Lanius</u>	" " "	622a
<u>Otocoris</u>	" " "	474
<u>Melanochorus leucophaea</u>	2 seen " "	605
<u>Amphispiza bilineata</u>	com. in flocks " "	573a
<u>Passer domesticus</u>	abundant in town.	P. d.
<u>Mimus p. leucophaea</u>	com.	703a
<u>Heliodytes</u>	Nests com. in cactus	713

## Reptiles

<u>Phrynosoma hernandesi</u>	one found on mesa
<u>Eutropis</u>	one small one seen.
<u>Cnemidophorus</u>	com.
<u>Halbrookia texana</u>	one seen.

## San Marcial to Mescal

Aug. 1. Found the same Lower Sonoran plants along the river valley a few miles below town. Then turned up mesa and up the north slope west of the Lower Sonoran species disappeared or were replaced by *Bala californica*, *gutturaria* & *yuccas* of the low *radiosa* type. Across the lava beds, and in fact all the way to Engle, it is so close to zone limit that the least slope makes a difference. Creosote, mesquite, *Baccharis glutinosa* covering the warm and *gutturaria*, *yuccas* & grass covering the cold. After passing Cutler the slope is generally to the south & Creosote, mesquite & tall *yucca radiosa* predominate, becoming larger & more abundant down toward Rincon.

The Valley ~~Journal~~ *del Muestra* is unusually green and grassy just now with rainwater standing in many basins, tanks & runs. Lots of horses & cattle were seen.



## Musilla Park

Drove out over the valley and around the experiment station, Agricultural college and Las Cruces. Then went back to the college and talked with Prof. Wooten till dark. Saw the collection of birds and mammals and plants and got some good plant names and a few important records for birds and mammals.

There were several skins of Amispars <sup>746</sup> flaviceps from Musilla and a skin of Sigmodon berlandieri and one of Myotis myotis. The odor of Myotis was very strong in my room in the adobe hotel and as I passed some of the old adobe houses in Las Cruces. Bats were numerous in the evening, probably of this species.

## Misilla to El Paso

Aug 2, Plants are the same all the way down to El Paso, until we reach the bare bluffs where Agave lechuguilla and acacia constricta begin. These go farther north along the mts. but were not seen farther up the river valley.

Great forests of Prosopis pubescens cover the flats in places on land occasionally flooded. Baccharis glutinosa holds the regular flood land.

There is much good agricultural land on the flats but little of it in cultivation.

At Misilla good drinking water is pumped up from 75 to 100 feet down and on some of the ranches here pumping plants for irrigation.



El Paso to Denning

Aug. 2.

Aug. 2. West to Laramie *Corylla tridentata*  
mesquites are abundant, but here  
they get scarce & *Yucca radiosa*  
& *Agave* *Ephedra* & grasses are  
the main vegetation. This is  
on top of the plains & Lower Gorum  
is not here.

*Dipodomys spectabilis* vowels  
begin at Zahara and are there  
common westward to Cochura

A bunch of 4 <sup>Antilocapra</sup> antelope was seen at the point of Cape rock

The highest point on the road is near Cambridge and even here there is considerable low mesquite, lots of tall *Yucca radiosa*, *Ephedra* with occasional patches of *Cercocarpus* and *Zinnia* but where the slope dips to the north all of these disappear.

These high plains, which largely  
Lower Sonoran are not pure,  
and are so close to Upper Sonoran  
that a slight incline to north or  
south throws them in one or the  
other zone.



✓ Corvus cryptoleuco<sup>487</sup>, several flocks seen  
near Lamark and Aden & Cambray.

✓ Callipepla squamata<sup>393</sup>, seen near Cambray  
and

✓ Geococcyx<sup>355</sup>, Several seen, near  
Aden & Cambray

✓ Lepus texianus, common all along  
~~Lepus texianus~~

✓ Dipodomys spectabilis. " from Lamark to  
Denning.

## Cainagra

Cainagra - is the Mex. name of Rumex alata, which grows abundantly in the sandy soil around Deming. It has big fleshy roots like carrots, dark red & astringent like rhubarb.

Hatchkiss tells me this is extensively used in tanning leather & that a tannery was put up at Deming to utilize it. & a ranch started to raise it.

Says it dyes very well but colors the leather very dark red. He has used it on buckskin. He says the root sells for about 8 dollars a ton & on wild land a ton can be plowed up on a few ~~acres~~.

This might be a valuable crop for sand that will raise nothing else. It grows native in the Nebraska & Kansas sandhill regions & where nothing else will grow. The roots are storibouses for moisture.

## To Silver City + back to Deming

Aug. 3. From Deming to Faywood or beyond the road crossing of the Miimbres, Lower Sonoran shrubs are abundant, <sup>P. ~~flavescens~~ ~~arborescens~~</sup> low mesquite, big green Ephedra, Zizyphus, Guttaria, and tall Yucca radiosa. From the lower Miimbres to about 6 miles south of Silver City it is grassy plains with very little else, except a few Yucca radiosa on south slopes. Then real Upper Sonoran species begin on the foothills, Nolina, Juniperus paezophloea & monosperma, Quercus arizonica, Mimosa biuncifera. The Yucca radiosa stops abruptly where these plants begin.

The question is whether to name the neutral grassy strip as upper or lower Sonoran? The same question applies to wide strips east & west of Deming - It is not pure (or strongly mixed) lower Sonoran, but aside from grass there is not an Upper Sonoran plant.



Deming to Watkins Ranch (30 mi S.W.)

- ✓ *Prosopis glandulosa* - common & big on all sandy soil
- ✓ *Covillea tridentata*, abundant & big on high gravelly mesas along south slope of Red Mt. & last 10 miles of trip.
- ✓ *Zizyphus*, Abundant & big on all sandy soil. most of the way.
- ✓ *Koeberlinia spinosa*, abundant & big about 10 miles across basin south of Gage.
- ✓ *Flourensia cernua*, abundant on gravelly soil with *Covillea* & in spots between.
- ✓ *Lycium andersonii*?, abundant by spells all day.
- ✓ " *pallidum*?, a few small bushes seen.
- ✓ *Yucca radiosa*, tall trees common all day.
- ✓ " *macrocarpa*? a low form 3 or 4 feet high common last 7 miles.
- ✓ *Ephedra trifurcata*, Abundant first 20 miles, some all along.
- ✓ *Atriplex canescens*, common on alkali level.
- ✓ *Opuntia leptocaulis*, a little seen in several places.
- ✓ " (brown spined) " " " "
- ✓ *Gutierrezia*, Common on flats where nothing else grows and on some of the mesas.
- ✓ *Astragalus filifolia*, common on some of the sand.
- ✓ *Prosopis glandulosa*, abundant on sandy soil, in washes, & on slopes.

Deming to Watkins Ranch

Aug. 44 Left Deming at 10 AM & made about 30 miles S.W. to a cattle ranch belonging to Mr. Watkins (~~The Clouds Ranch~~) Aneroid set at 4330 at Deming read 4400 at the windmills south of Gage and 4600 at the ranch at camp. The country seems perfectly flat except a slight rise in the last 10 miles. There are many flats, almost playas, but mostly covered with "gayitha" grass or *Gutierrezia*. There are also wide strips of sandy soil, blown into dunes around the mesquites and *Zizyphus* bushes where little else grows. Then on the foot slopes of the buttes and ranges there is gravelly mesa covered with a good growth of *Cercocarpus* and *Flourensia cernua*, and *Lycium andersonii*? For 8 or 10 miles across the barren wash where the windmills are (south of Gage) there is abundance of *Koeberlinia*, big bushes and commonest shrub. The whole distance is pure Lower Sonoran as shown by the abundance of big mesquites where it grows, the



Deming to Watkins Ranch, 30 M. S.W.

abun

Birds

Hirundo 613, Numerous in Deming, a few  
P.d. still hanging around nests under hotel piazza  
Passer domesticus, Abundant in Deming

abundance of Mesquite bush on the  
highest land and the predominance  
of Lower Sonoran & absence of Upper  
Sonoran species.

Mammals.

✓ Antilocapra, my driver says he  
saw 3 about 7 miles west of Deming  
a month ago.

✓ Citellus spilosoma, Common, often heard & shot.

✓ Neotoma houses numerous

✓ Dipodomys spectabilis, wounds common on  
plateaus, highest slopes, especially on the  
side of Red Mtn. & near the Watkins ranch.  
not common across bottom of plain.

✓ Lepus arizonae, common.

✓ " texianus

" (white sided?) 2 shot & saved  
& half a dozen more seen, about  
half as many as of the gray.

✓ Cynomys ludovicianus, a few near Watkins Ranch.

✓ Thomomys, hills common in  
places all along.

✓ Canis, Coyote tracks & howls common.

✓ Taxidea, numerous old burrows.

Watkins Ranch to Huehuetla + Valley de las Playas.  
40 miles.

Aug. 5. Left Whitney Watkins ranch (4600) and followed up easy grade to pass in first ridge about 6 miles west (at 5000) then down across a wide valley about 10 miles (4700 at bottom) then over another low ridge at 4800 and down about 5 miles to Huehuetla (at 4575) aneroid reading 70 feet too high.

Got mail + supplies and struck west for Adobe Spring, crossed valley bottom (at 4450) then up long wash to deserted ranch at 8 miles (good water, no grass) then about 5 miles farther up to summit of ridge near Goldfield (5100) then down the west slope about 5 miles to Whitney's ranch at bottom of Valley de las Playas. and camped on east side of flooded playa.

Except for north slopes and higher parts of the 3 ranges crossed we were in pure and strongly marked Lower Sonoran zone all day.

Most of the Lower Sonoran species, such as <sup>*Condalia*</sup> mesquite, <sup>*C. frutescens*</sup> creosote, *Koeberlinia*, *Rhus microphylla*, and others go through each of the passes on south slopes, while <sup>*Cornus allagani*</sup> *Fouquieria* + other species are abundant only along the mountains.



Along the crests and north slopes of  
the <sup>main</sup> 2 ranges Upper Sonoran species such  
as *Juniperus monosperma*, *Salsolium*, *Nolina*,  
*Schoenobolus*, *Cassia*, *Mimosa biuncifera* &  
*Agave* take the place of the valley species.  
None of the ranges bore any timber except  
an occasional *juniper*. The big agaves  
go to the top of peaks at least 500 or 1000  
feet above the passes. The little range just  
east of Hedden has no *juniper* or agaves  
near the pass and is so low as to be  
much mixed with Upper Sonoran  
species.

We reached the Valley de las Playas  
late and found the big central playa  
flooded while other sheets of water could  
be seen to the north & south. We started  
to cross the big Playa near the middle  
but found the shore muddy & as it  
was getting dark were afraid to risk  
it as we could not tell how deep  
the water & mud might be.

So camped on the east side in plain  
sight of ranches & good water on  
the west shore. The horses drank  
some of the alkaline water & we used it  
for washing but had enough in our canteens

for the night. We had a beautiful  
camp place among <sup>*Prosopis juliflora*</sup> mesquites with  
abundance of grass and enjoyed the  
glorious night under the more glorious  
stars. The valley is overstocked  
and the grass killed out over most  
of it, but a broad zone of gayetta  
and saccaton surrounds the flatlands  
and supports a large number of  
horses & cattle & <sup>*Lepus*</sup> jack rabbits.  
The rabbits have gathered in the  
grassy land and a dozen at  
a time could be seen feeding.  
Other rodents were also abundant  
and the sandy soil was tracked  
up with rats & mice. *Dipodomys*  
*spectabilis* rounds and *Neotoma*  
houses are a conspicuous feature  
of the landscape.



Playas to Animas Valley & Mts.

Aug. 7. 6 Crossed the playa without any trouble & found the water only about 4 inches deep and the bottom solid. The water is thick & creamy and alkaline. It forms a lake 3 or 4 miles long & half a mile wide.

On the west shore are some cattle ranches and springs of the best water we have found since leaving Deming. Cottonwoods & willows grow on the wet ground. From here we struck west to a low pass in northern part of the Animas Range. Crossing at 5000 feet and turning south along the east side of Animas valley we kept it about 5000 feet to 12 or 15 miles south of the pass to "the Adobe", a cattle camp on Double Adobe Cr. at 5100. Here we learned that ~~the boys were~~ Goldman & Birdseye were in a canyon about 4 miles farther south, so we pushed on and got into camp about 5 P.M. at 5800 feet in Apache Canyon at north base of Animas Peak. The camp is in an open live oak gulch with only pools of water.

## Animas Mts.

Aug. 7. Followed up Indian Canyon from camp around east and south of Animas Peak to top of the first peak south of Animas. This peak is 5000 or 6000 feet lower than Animas Peak (both our aneroids read 8000 on top) but has much more timber on it. Deer Creek heads on its S.E. slope and Indian Cr. on its N.E. From this peak we were able to map the country pretty fully as we had a clear view of the Peloncillo and ~~San~~ <sup>San</sup> ~~to~~ <sup>to</sup> ~~Guadalupe~~ <sup>Guadalupe</sup> Mts. on the west, the San Luis range to the south, the Huelito, Dog Mts., Boca Grandes, & Hermanos on the east. Even the brushy Lower Sonoran valleys, covered with mesquite & creosote, could be distinguished from the smooth, grassy upper Sonoran valleys & slopes.

The Animas range is all Pleistocene, and the group of high peaks may well be remains of old crater rims. The high part does not extend more than 10 miles along the middle of the range, but the low ridges run north & south. Upper Sonoran zone covers most of the range & the valley slopes.



east + west, as well as the big valleys  
S.E. + S.W. and goes up on south slopes  
to the top of Ahimsa Peak at 8400.

Transition zone covers the cold  
slopes from about 7000 feet to the peaks,  
~~the a trace comes down the canyons~~  
~~to about 6500.~~

It is marked by *Pinus ponderosa*, *P. arizonica*,  
*P. chihuahuana*, *Quercus hypoleuca*,  
*Q. gambeli*, *Q. reticulata*, *Pseudotsuga*  
and many shrubs & plants.

A trace of Canadian zone is  
found in many small patches of  
*Populus tremuloides* in U.E. gulches  
and by a clear stand of *Pseudotsuga*  
& *Pinus flexilis* on the steep upper  
slopes above 7500 feet.

Saw lots of bear signs and some  
fresh and old tracks. The signs were  
mostly composed of *Mammoth* berries,  
some old contained acorn shells and  
one lot was entirely filled with balls of pig  
hair. Some of the deposits were very  
large (of 2 inch caliber) and some of the  
old tracks were large. One fresh track  
of a yearling was seen. Great numbers  
of stones have been turned over & good

bear trails follow the gulches where  
no stock goes. There is water along  
the upper part of the canyons, good  
pure cold running streams, and the  
bear trails follow the canyons to water.

There are a few blacktail deer in  
the foothills & lower slopes of the mts.  
and the little white tail is abundant  
on top of the range. Their tracks are  
numerous all over the ridges in beautiful  
park like country where no stock runs  
& few people ever go. Three old bucks  
were seen at 7800 feet, lying on  
an open slope at the extreme head of  
Deer Creek. One shot was in the gray  
coat & with half grown velvet horns.  
Its stomach ~~contained~~ was full of  
mainly leaves & twigs & seeds of  
*Arceocarpus p. parvidentatus* & a few *geranium*  
& other stems. The deer would have  
weighed about 100 lbs.

We saw a fresh mountain lion track.  
saw *Eutamias dorsalis*. *Thomomys fulvus*  
hills were seen up to 7800 feet. *Lepus*  
*hofmanni* is common to near park.



## Fireflies

In the evening at our camp long streaks of pale light went sweeping by so different from eastern fireflies that I got my gun and aimed several of the insects. They proved to be *Elater*<sup>naevip.</sup> ~~pyrophorus~~ *Pyrophorus physodeirus*, with a flashlight on each shoulder. They were an inch or more in length and their rapid flight and long sustained light was startling in effect. I brought some back and Mr. Allen identified and put them in the economic collection.

There are 7 species of oaks and 5 species of pines & *Pseudotsuga* & *Arbutus* and *Mazaniata* & ash & box elder & Aspen & Ash & walnut & sycamore & two agaves in the cuts.

But no extensive bodies of timber. There is much chaparral too dense and large to get through conveniently and a great protection to the water supply and to game. Stock does not get into the cuts, & best of all there are no trails and no one goes up them on horseback so they are rarely entered.

At the Gray Ranch I am told that black, brown & silver tip bears are found in them & that the bear kill a good many pigs on one ranch east of the cuts.

## Animas Valley

713 Aug. 9. Followed down Indian Creek ~~to~~  
~~the~~ ~~de~~ wash to the dry bed of Animas  
Creek, at 4800 feet. Then south up the  
valley about 10 miles to the Gray Ranch,  
at 5000 feet. This is a broad  
grassy valley some 10 miles wide  
between the Animas <sup>into</sup> & Cloverdale Hills.  
At the mouth of Indian Creek there is  
a strong trace of Lower Sonoran with  
much mesquite & chilopsis & Yucca radiata  
old Heliodorus nests, lots of <sup>703</sup> nesting birds,  
etc., but south of here there is ~~is~~ some  
a trace of Lower Sonoran.  
There are almost no bushes, and  
the heavily stocked slopes are grassy  
or barren. A few stunted ~~catalpa~~  
& much dwarfed mesquites are scattered  
on south slopes and a few ~~catalpa~~  
bushes are seen. Live oak bushes  
come down washes on both sides,  
and a few ash & maples & Bumelia  
bushes or trees grow along wash  
banks.

There is no water in Indian Creek  
or in Animas Creek except in the  
~~a narrow place on the Gray Ranch~~  
~~where the creek cuts through~~  
~~a lava ridge & narrows at~~



The Gray Ranch is an old place now owned by the A. Diamond A. Cattle Co. who control Arimosa & Playa Valley ranges. It is the ranch where Geronimo was brought when captured and is now merely a headquarters for cattle men. It lies on the opposite side of the valley from and just south of the middle of the Arimosa Mts. Some big meadows and bottom land fenced in make excellent horse pastures.

We reached the ranch at 2 P.M. We were invited in to a good dinner & I then saddled up & started for a bat cave in the Colorado hills 7 miles west. Found it in the bank of the wash north of Clinton Creek, up in the foothills.

The cave is a washed out place in a cliff of volcanic scoria & ash and baked rock, full of great chunks of obsidian. It is 20 feet wide and 10 feet high at first but soon narrows down about 50 feet back and then extends in a low tunnel as much farther.

but not high enough to stand up in.  
In downed section about 40 feet back  
I found a mass of bats hanging to  
the roof like a swarm of bees.

They were packed in a body 3 or 4  
feet long and a foot to 18 inches  
wide, hanging head down. As I approached  
many flew out and circled about in  
the cave, so for fear of scaring them  
I backed part way out & shot into  
the mass with the .40 three times.

At each shot a mass of bats dropped  
but a few still clung to the roof  
when I went up & picked them off.

I gathered up my pockets full of  
bats and outside counted 912  
of them - 4 *Nyctinomys* and the rest  
a little yellow bat

Outside I saw 5 *Coronophrinus*  
*pallidus* flying about in the  
sunlight, probably driven out of  
the cave by my shots. Some of  
these went back into crevices high  
up in the cliff and some into an  
old hollow tree. I shot one at  
the tree but the rest escaped.



The cave has been located as a mining claim and is supposed to hold valuable guano. There is probably 20 bushels of dry bat dung & dust in the cave and below this dry loose earth. There are a few small bones in the dirt, but not enough in sight to be of importance. The floor of the cave is dry and slopes down so as to be perfectly drained & digging would probably disclose some good bone deposits.

The creek valley at the bat cave is a beautiful place to camp, good running water, a flat valley bottom with open prairie & groves of live oaks and big spreading single trees, between the cliffy borders. One large Chihuahua pine grows by the creek and lots of cones along the creek banks indicate more pines above.

There is said to be a patch of yellow pine farther up in the hills but most of these hills are upper Sonoran oak & juniper covered.

To Lang Ranch at Monument, ~~22~~ Mex. Boundary

Aug. 10, Left Grays Ranch at 5000 and drove 17 miles south to Lang Ranch at NE base San Luis Mts. at Monument ~~22~~ Mex. boundary survey & camped for the night. about half way up the valley we crossed a ridge 100 feet high (5200 feet) that forms a divide and makes a great Playa or lake bed south of it, 4 or 8 miles across. The valley all the way is open, grassy & barren mesa, 10 or 15 miles wide between the Animas & Clonidale Mts. & southward as far as we could see into Mexico between the San Luis & a little range south of the Clonidales. The valley is all Upper Sonoran. No a fence of much dwarfed mesquite is found on all south slopes. Holies & live oaks grow along the borders & junipers & oaks on the foothills.

The San Luis Mts are high and black with timber, extensive bodies of oak low down, and tall pines along the crest and upper slope.

There have been recent rains & grass is good over the



valley where it has not been killed out by overgrazing. Thousands of cattle are ranging over the valley. The great playa or lake bed is green with weeds but has grass in only a few spots.

We saw 4 antelope, all kingley, and the cowboys at the ranch say they see them every day in bunches of 3 to 17. Bunches of 27 & 35 are reported seen last winter.

White sided jackrabbits are said to be frequently seen along this valley but we did not see any.

Prairie dogs are numerous all the way and must do great damage to an already overtaxed range.

*Dipodomys spectabilis* *vancouveri* are common all along on dry mesa but not on the playa.

Prairie dogs and *Thomomys* are abundant over the weedy playa.

A *Citellus spilosoma* was seen on edge of playa. Badger holes are common all along. *Signodons* are said to be numerous around the water places at the Lang ranch. In evening Birds etc. shot 2 house wrens & 1 goldfinch caught.

an *antrozous pallidus* in the house.

Some large springs come out at the ranch and make a few acres of marsh around the tanks of good water.

The ranch is one of the ~~best~~ cattle camps of the A. Victoria Land & Cattle Co.

There are 5 cowboys breaking horses & raising feed - a good hearty rough lot.

The Lang ranch is a historic old place for Indian fighting & survey work. The house is old of adobe on an open mesa.



Lang Ranch to High Lonesome in Playa V.

Aug. 11. Left the Lang Ranch and followed north along side of playa about 6 miles, then turned east over San Luis Pass and down to Culberson Ranch on Deer Creek, then out onto the south end of Playas Valley and about 4 miles north to High Lonesome, in the middle of the valley, another ranch of the A. Cattle Co. Aneroid at Lang Ranch read 5100, on top of pass 5500, at Culberson Ranch on Deer Creek 5000, and at High Lonesome 4750.

The pass is all Upper Sonoran, mostly open country with short grass, *Nolina*, *Agave palmieri*, *Quercus emoryi* + *arizonica* along gulches, a few *Juncus* in shady places, the big thin leaved yucca, and catclaws. Down along Deer Creek we found *Platanus wrightii*, *Fraxinus*, *Celtis*, *Morus*, and live oaks and on hot slopes *Mesquite* and along hot bottoms *Chilopsis*.

The lower part of Deer Creek where it opens out onto the valley had the big valley or Lower Sonoran

rather open and grassy in places  
and again densely covered with  
Mesquite & tall *Yucca radiosa*.

There have been recent rains and  
grass is good and stock numerous.

Water is pumped by windmills at  
the ranches and cattle ranges are  
several miles on all sides.

There are miles of good gayetta grass  
flats and lots of better quality of grass  
on higher ground. The soil of the  
valley is excellent and will someday  
be worth irrigating by pumping.  
The water is good at all of the  
wells we have struck in both the  
Playas and Animas Valleys.



## Mammals

- Antilocapra mexicana*, One seen near the Cienega + 13 reported in a bunch a month ago near High Lonesome.
- Ovis Mexicanus*, Said to be a few in the Hatchets.
- Odocoileus caninus*, A big buck said to be seen frequently on Walnut Cr.
- Citellus epilosus*, Common all along in Playas Valley + in Hachita Valley.
- Cynomys ludovicianus*, Common in many places in both Playas + Hachita Valleys. Often so numerous as to kill out the grass.
- Neotoma albigula*, Houses abundant in both Playas + Hachita Valleys. Often very large (to 10 bushes) + usually in *Cercus*, *Yucca* or *Koeberlinia*. Made of sticks, chips, dried clay from road etc.
- Dipodomys spectabilis*, Wands common on higher ground in both valleys.
- Thomomys* hills all along.
- Lepus texianus*, Common.
- Lepus arizonae*, " "
- Badger* holes common.
- Canis nearcticus*, Heard howling, tracks common.

## High Lonesome to Hachita - 40 miles.

Aug. 12, From High Lonesome in north end of Playas Valley (4.05 mi. N of here) we came north through gap between Hatchet + Hachita Mts. and up the valley to Hachita, said to be 40 miles. Aneroid at camp read 4700, at Cienega Ranch 44, at Hatchet ranch 4350, at Hachita 4600, <sup>1800 ft to top</sup>. The road is excellent most of the way and all down grade to the gap between the Hatchet + Hachitas. The drainage of the Playas Valley is east through this gap into the south end of Hachita valley + then evidently on to the S.E. Hachita valley rises to the north, while Playas and Arinos valleys are higher to the south.

The whole trip today was in lower Sonoran zone, with extensive flat grassy areas but the upland and dry soil covered with *Yucca radiosa*, Mesquites, *Ephedra trifurcata*, *Zizaniopsis*, *Flourensia arborescens*, *Koeberlinia*, *Lycium andersonii*, *Atriplex canescens*. and on the higher side slopes in the gap *Covillea* + *Yanguiera*. Also *Covillea* near Hachita.



Hachita to Lordsburg -

Aug. 13. Packed specimens all of forenoon.  
Sent the team back to Deming &  
took train around to Lordsburg,  
but have to lay over night and  
get a morning train to Deming.

The valley is Lower Sonoran all  
the way from ~~Hachita~~ <sup>Agua Prieta</sup> to Deming,  
with abundance of Mesquite, ~~Croton~~ <sup>Croton</sup>,  
~~Flourensia~~ <sup>Flourensia</sup> cernua, Ephedra, Zizyphus,  
& Yucca radiosa. There are extensive  
grassy flats or flats bare of even  
grass, but evidently these as well  
as the brushy parts of the valley are  
Lower Sonoran. Grass is short &  
poor except on some of the flats.  
The rains seem to have missed  
this section, tho just north of  
Lordsburg the grass is said to  
be green and abundant & rains  
have been frequent.

A heavy shower can be seen to  
the south, about the Animas Range.  
and others in more distant sections.  
The rains are mainly narrow  
and but frequent and often violent.  
The showers gather around the peaks and  
then cross valleys from one range to another.



They gather around the high peaks of the Hetchus, Animas, San Luis and Chiricahua Mts. and cross back and forth over the valleys between, consequently keeping these valleys much greener and more grassy than in the more open country from Hachita to Lordsburg & Deming.

Aug. 14. Lordsburg to Deming and up to Silver City. Found Hetchus is still off on a camp trip, so began our reports and notes.

Aug. 15. Got saddle horses and rode up the creek valley about 5 miles north of Silver to where the big agaves and yellow pines are common on the cold slopes and the <sup>poplar wood</sup> pines on the creek flats. They begin at edge of Forest Res., and extend around and up the back of Pinos Altos. <sup>large ones</sup> Walnut trees are abundant along the creek valley from back of Pindotas place to the yellow pines, some trees are 2 feet through and 40 feet high with a spread of 50 or 60 feet.

They are loaded with good sized nuts which are ripe and falling off. I collected a good series of branches & nuts & sent to Sudworth in the hope that he will recognize the well marked species of *L. <sup>argentea</sup> major*, instead of calling it *rusticus*.

Aug. 14 to 18 - Remained at Silver City, writing reports and making preparations for the trip.

Aug. 19 Started with team and camp supplies to the GOS ranch to find Hitchkins and by accident a good luck he had just come in to the GOS ranch from his camp on Big Rock Cr., about 15 miles NE. Made arrangements to go to his camp and start with packs from there.

On the trip over we found good crops and abundance of fruit along the Rio Grande. Apples, pears & plums are loaded with excellent looking fruit, & peach & cherry trees are past fruiting but in good condition.



2225

GOS Ranch to Ferry place.

Aug. 21, Hotchkiss & his nephew came over in morning with 8 horses & a mule & moved camp over onto Big Rocky Creek, about 5 miles farther north. This is a yellow pine & Douglas spruce gulch at 8000 feet with a good stream of clear cold water, steep rocky sides covered with timber, a mixture of nut pine <sup>Pinus edulis</sup> & juniper oaks and yellow pine on south slopes. Yellow pine, Douglas spruce & Pinus flexilis on cold slopes. A few Aspens <sup>*Populus tremuloides*</sup> begin a mile above in cold gulches and *Populus angustifolia* follow up the creek a mile or two above camp. There is abundance of good grass over the ridges on both sides & lots of wild oats chess in places.

## Mammals. Rocky Cr.

- ✓ Odocoileus hemionus, Com. low down
- ✓ " conesi Can. high up to peaks, mainly Transition.
- ✓ Sciurus aberti, Can. in Yellow pines
- ✓ " magellanicus, Can. in Canadian
- ✓ Eutamias cinereicollis " Transition above
- ✓ " dorsalis " Upper Sauran
- ✓ Callospermophilus lateralis, " in Transition, 8000-9000
- ✓ Peromyscus sonoriensis, 1 at 8000 feet in woods
- ✓ Neotoma ~~monticola~~ mexicana, Canon in Transition.
- ✓ " orophilus, " " Canadian, many houses seen up to 9000 on cold slopes
- ✓ Thomomys fulvus, Com.
- ✓ Urocyon scottii, "
- ✓ Mephitis, " this Transition.
- ✓ Canis meamsi, " lower down.
- ✓ " mexicanus, No signs of wolves, tho a den was found just above camp last year in the gulch at about 8500.
- ✓ Felis aztecus, Still a few.
- ✓ Lynx baileyi, Common.
- ✓ Ursus amblieps, Common.
- ✓ " horrius <sup>horrius</sup> Scarce.
- ✓ Lepus, A few
- ✓ Vesperugo fuscus <sup>vespertilio</sup> Common.

## Rocky Creek

Aug. 22 - Caught but little in our traps but shot chipmunks, Callospermophilus + birds Abert squirrel + birds. Shot a painter redstart + red faced warbler, both in fine feather condition + evidently breeders. Found houses of Neotoma orophilus in Canadian zone timber on cold slopes at 9000 feet.

Aug. 23 - Went up to Breaking Asp Peak above the spring of same name about 6 miles east of camp. The aneroid at camp read 8100, at Spring 9000, on peak 9750. Found dense Canadian Zone timber of aspens, fir, Douglas spruce + Pines flexilis (or strobiliformis) on cold slopes above 8500 feet and on top of ridges above 9000 feet, but Transition yellow pine runs to top of peak on SW slope.

Found plenty of Sciurus magellanicus and houses of Neotoma orophilus. The aspens are all tracked up with beaver near the spring. Rained most of the time so we couldn't do much.



To Diamond Cr.

Aug. 24. Packed up and started north on the North Star Road. Aneroid read 8100 at camp, 7700 at Fork of Rocky Cr. 8200 on highest ridge of Mesa, 8000 at rim of both sides of Black R. Canyon 7200 at bottom of canyon at Diamond Bar Ranch, and 6800 at Diamond Creek.

It is pretty pure Transition zone all the way except the hot slopes in going out of Rocky Cr. and along the hot slope of Black Canyon. The bottoms of both Black Canyon and Diamond Cr. are mainly Transition, full of yellow pines & Populus angustifolia. The mesa tops are mainly open, yellow pine forest with scattered nut pine & cheeker backed juniper and on warm slopes Aureus arizonica. Grass is generally good but especially so between Black R. & Diamond Cr.

The bottom of Black Canyon is narrow, but flat & rich & gives long narrow meadows of good hayland. Beautiful groves of Populus angustifolia grow along the river and some

Aminoas Mts.

boxelder and walnut trees are scattered along. There are lots of rock squirrels + I saw fresh coon tracks.

The steep canyon slope facing SW is mainly Upper Sonoran, covered with live oaks (arizonica mainly) and nut pines + juniper + Quercus parvifolia. The mesa tops are largely open grama grass country north of Black Canyon, but yellow pines are the principal edge & gulch timber.

Diamond Cr. valley is more open but both slopes are mainly yellow pines. The flat bottoms are beautiful open groves of Populus angustifolia + a few yellow pines. No body lives here now, but there is an old log house & fenced field of weeds & grass. The bottoms are 40 to 60 rods wide of good yellow silt sand.

Along the sides are low cliffs of conglomerate shelf rocks that show shallow caves & in these are old cliff storage places like the cliff houses but smaller.



East Fork Gila.

Aug. 25. Caught Neotoma (palmeri?) and a  
little Perognathus and stopped  
to make up skins so did not get off  
till noon. Crossed over a 400 foot  
ridge and down to the east fork of the  
Gila at 6700 feet, then up it about  
3 miles to mouth of Beaver Creek at  
6800 feet & camped on the site of  
old Fort Vincent.

✓ The narrow flat bottoms & cold  
slopes of the East Fork are transition  
with Populus angustifolia & Pinus ponderosa,  
but the warm slopes are Upper Sonoran  
with both junipers, nut pines, blue  
oaks (arizonica) & Yucca baccata. There  
are lots of walnuts along the bottoms &  
a few boxelders, Celtis, & one alders.  
Lava or metamorphic rock walls border  
the narrow river flat most of the way  
usually 40 rods or more apart but  
in places narrowed up to a low canyon.  
Above this river the valley slopes  
are gradual, with good grass &  
open or scattered timber.  
No one lives along the river as it is  
all VXT range.

## To Beaver Lake

Aug. 26 Rained hard most all night & we caught only a few Peromyscus & a Neotoma along the cliffs. A Lynx came past close to camp in morning & I shot a Eutamias dorsalis on the rocks. Heard rock squirrels.

Broke camp about 9 and climbed onto high mesa (7400 feet), then down to Beaver Creek at junction of Cardrona. Up Beaver to V+T ranch and about 2 miles above to Beaver Lake and camped on west mesa about 100 feet above lake at 7500 feet by aneroid.

After reaching the top of the first long slope of Upper Sonoran junipers, nut pines & blue oaks we struck into open yellow pine forest that continues all the way except on local hot slopes. There is much open grassy mesa top and valley bottoms & to the N.E. there are great green mesas & the Prairie Mts. a grassy range of smooth high hills.

Beaver Lake is about a mile long & 40 rods wide, between high cliffs of the old creek valley. It is not very deep but seems to be 8000 feet in places.



Beaver Lake, <sup>lake</sup> Gila Nat. Forest.

Odocoileus hemionus - A good many fresh tracks & old horns seen along the road.

Antilocapra - Hotchkiss says there are more antelope in here near Beaver Lake than any place he knows. When camped here last January trapping wolves he saw antelope every day & thinks there were 600 or 700 in this vicinity. He counted as high as 80 in a bunch. Says they are common on the Cooney prairie between the Black Range (just west of here) & the Elk Mts. & that some get onto the mesa south of this little "Black Range." Also a few on the mesas on head of Indian Creek, south of Corduroy last winter, about 20. He says a band of some 25 Navajos were in here last winter hunting deer & antelope & he thinks they got a big lot of both. He saw an Indian trying to sneak onto a bunch by carrying in front of him a hoop of cloth painted to represent an antelope, but one of the cowboys saw it & began shooting and scared them off. The Indian followed after the bunch and probably got another chance.

is formed by two opposite side gulches that have washed heavy sand across Beaver Creek channel & dammed it up. The water is fresh & good & there are weeds around shore.

A marsh a mile below furnishes good breeding ground for some birds, but ducks are said to be common on the lake at all seasons, especially in winter. There are 7 species here now, Mallards, <sup>132</sup>Goldeneye, <sup>135</sup>Goosander, <sup>140</sup>Blue-winged teal, <sup>139</sup>Ruddy, <sup>149</sup>Scaup, <sup>146</sup>Redhead also <sup>221</sup>Coots & a lot of sandpipers. <sup>497</sup>Yellow-headed blackbirds, <sup>498</sup>Redwings & <sup>510</sup>Brewers are common in the marsh below & rails were heard there also. The gulches are full of timber, yellow pines & gambel oak, & bushes along the lower cliffs. Good cover for birds & mammals.

Birdseye was anxious to set wolf traps so he & Hotchkiss went out & set 3 before dark. Hotchkiss says there were lots of wolves here last winter.



Cervus merriami. Hotchkiss saw  
a fine bull elk in the N.E. corner  
of the Mogollons (on Lily Mtn.)  
in 1894 and tracks of three  
elk were reported by a ranch  
man the same year. These  
are the last elk Hotchkiss  
knows of being seen in this region.

Eutamias dorsalis, common all along  
on rocks & canyon walls. One shot  
at mouth of Beaver Cr. eating ripe  
fruit of big Opuntia like englemanni.  
It had its cheeks full of seed  
and its nose was purple with  
the juice.

Two were killed (a bull & cow) by Spencer Hill  
in the Mogollons about 1890, Hotchkiss says.  
Hill owned the Gila Hot Springs then.  
The horns <sup>+ head</sup> were in silver for a long time  
but were sent by Hill to his father  
at Copperville, Kansas. It was said  
to be an unusually fine head.

## Beaver Lake

Aug. 27. Hunted ducks & water birds,  
mainly with field glass and got  
a good bird list. Found where a  
Porcupine lives in a rock den. &  
there are lots of prairie dogs, C. gunnisoni.  
Saw antelope tracks close to camp.

Aug. 28 - Broke camp and followed  
up Houghton Canyon west of Lake  
about about 6 miles, then out onto  
open mesa and a few miles over it  
at about 8000 feet, then up a long  
dry gulch and over an arm of the  
Elk Mts. at 9000 feet & down the  
west slope about 4 miles and camped  
in gulch at 8400 feet. Have come  
nearly straight west all day  
probably 15 miles.

The country is all transition  
zone except the steep south slope of  
Houghton Canyon which is covered  
with nut pines, junipers & blue  
oaks. The rest is yellow pine  
& Gambel oak along gulches and  
over mountain ridges and the  
mesas are open, grassy plains  
but without transition.



Canis lupinus, Saw lots of wolf tracks  
made last night & night before  
on the high mesa at head of  
Houghton Cr. Canyon. Three or four  
had been along the road together  
& some were very large.

This is ideal country for them.

Odocoileus hemionus. Saw one large  
buck with big horns on the mesa  
at head of Houghton Cr. Canyon &  
a buck & doe at the salt trough  
where we camped as we rode  
up. All were in the red coat &  
the bucks horns were nearly full  
grown.

There is no water in this part of the  
Elk Mts. & they are covered with open  
and rather scrubby timber of yellow  
pine & gambel oak except in the draws  
where there is a fine stand of big  
yellow pine. One little bush of  
aspens in a cold gulch was the  
only trace of Canadian. There were  
few signs of mammals or birds.

The mts., like the whole country, are  
of lava rock and very stony but  
of good soil & yield good grass.  
The peaks to the north of our camp  
which seem to be the real Elk Mts.  
are much higher & seem to have  
Canadian zone timber on the cold slope.  
A great stretch of high mesa  
country lies to the west of us &  
reaches across to the timber of  
the Mogollons. It must be all  
above 8000 feet & mainly transition.

## Elk Mts

Aug. 29. With barometer reading 8600 at camp we followed a mile down the gulch to Canyon Creek (about 8500) then up it past an old lava basin lake and the stone wall, then west over a high mesa and onto a branch of the N. Fork of Gila, then onto high mesa again north of it and along south base of the real Elk Mts. to edge of timber on mesa across first creek out of Elk Mtn. Crater & camped at 8600. Rained from 8500 to 8600 all day over magnificent grassy mesas, usually stone and often typical of Walpais but with rich soil & fine grass. There has been much rain & streams are mostly running & grass is luxuriant and flowers are abundant & brilliant. A few *Pinus ponderosa* & *Quercus gambeli* come down the gulches & the mesa plants are all transition or neutral. *Artemisia frigida* is one of the characteristic species. There are many cattle on the range but not enough to keep the grass down. This is still V+T range.



## Stone wall

Meanwhile we struck Camper Creek. An old stone wall crosses the valley and follows the eastern rim a mile or two where we could see it, but we did not see the other two sides of an inclosure. It is in a rectangle crossing the valley east & west & following the side North & south in straight lines. It has been a good sized wall, 5 or 6 feet high & wide, but seems to have been in ruins for 100 years or just as well a 1000. No one knows its origin or history. Hatchek's says he thinks it extends for many miles.

It could have been used as an antelope or elk enclosure or pasture but seems unnecessary and would not serve as a trap or pound. More likely it was a sheep pasture built by some of the early settlers. It is on walpais where broken lava covers the ground & the stones used are such as cover the country.

## Elk Mts.

Camped on mesa in edge of yellow pines at S.W. base of the real Elk Mts. at about noon. I walked 2 miles to the base & then climbed to the highest peak of the rim of the old crater, 10200 feet, and followed half way around the rim of rough lava rock. The crater opens out in 2 gulches to the S.W. with good streams flowing down them. The slopes are steep & rocky with aspens and firs down to 9000 feet in cold gulches and on south slopes above 10000 feet. *Pinus flexilis* & *ponderosa* are abundant on cold slopes from 9000 to the top and *Abies globulosa* & *Podocypus nageviensis* are common on cold slopes.

Transition zone runs up to 10000 on the SW slopes with scrubby *Pinus ponderosa* & *Arctostaphylos uva-ursa*. All around the base of the Mts. is good forest of yellow pines & in the draws it is unusually tall & large. I measured one fallen tree 4 feet through at base and 150 feet long & there were lots more like it standing.



To Negrita Cr. & Kuneys.

Aug. 30. Broke camp at 7:30 and in about a mile struck the forks of Snow Creek, followed up it and then west across open mesa to the divide & down Beavercreek Creek to the Negrita and camped in canyon near Kuneys Ranch. Arrived at camp 8650, on Snow Cr. 85, on Summit 8600, on Negrita 8000, on mesa south of Canyon 8000, at camp in canyon 7200. Struck into yellow pine woods at head of Beavercreek Cr. & kept in it all the way except on a big open mesa crossed before the last descent into canyon. The Mogollon Mts. rise steeply from the Negrita and on steep rocky N E slopes *Picea pungens*, *Abies concolor* & *Aspens* come down to the creek. On more gradual slopes Canadian zone begins higher up. *Pinus ponderosa* & *Populus angustifolia* follow the creek both ways all the way down but the hot slopes above the bottom are vainly covered with Nutpines, junipers & blue oak (*Q. arizonae*).

The Tuhroza Mts. come down close to the Negrita on the North but a strip of upper Sonoran covers the lower S.W. slopes, the Transition zone timber comes down the gulches and makes perfect connection across the canyon to the Wogollons, as it does also across in a solid body to the Elk Mts.

The upper Negrita canyon is a beautiful narrow valley with open pine woods, a beautiful stream and ideal camp grounds all along. There are a few old cabins but no occupied ranches. The trail is good most of the way except a few rough narrows and steep stony trails up onto the mesa & back in below.

At a salt trough we saw a little white tail buck & Abe & Hotchkiss shot the buck, a two year old in the gray coat & 2 point velvet horns. We carried it along on the pack & skinned it at night. Would weigh about 75 lbs.



## To Frisco & Reserve

Aug. 31, Followed down Negrito Cr. to the Tulerosa & the Tulerosa to the San Francisco R. & up it to Frisco & Reserve and camped in Mr. Hamby's pasture a mile north of Reserve.

Averoid at Camp 7250, at Tulerosa River 6300, at Frisco about 6200 and camp 6200.

The Negrito canyon is a beautiful wild gulch with high lava walls in places narrowing up to a mere rocky gorge, & again widening out with beautiful wooded bottoms, tangled up with grape vines.

Down to near the lower end of the canyon the cold slope and moist bottom are transition with yellow pines, <sup>Juniperus scopulorum</sup> douglas spruce, and *Populus angustifolia* predominating. The hot slope and more open lower end of canyon are Upper Sonoran covered with *Juniperus sphaerophloea* & *monosperma*, *Pinus edulis*, *Quercus arizonica*, *Cercocarpus pauciflorus*, *Yucca baccata*, etc.

No one lives in the canyon below the Hummer Ranch.

A fine stream of good clear water all the way is said to be permanent. There are beautiful spots for camps all along. Under groves of cottonwoods or pines or junipers or walnuts with open park like clearings and peaks and cliffs and caves to be explored.

After Deer tracks were numerous at salt licks and Abert squirrels rock squirrels and chipmunks were common all along. Mouse houses were seen in rocks and brush piles and old beaver stumps were numerous.

One Cottonwood tree cut half down by beavers measured 24 by 26 inches at the cut. - see photo. But the beaverwork is all old 10 or 20 years at least.

At Frisco they say fruit does not do well on the river bottoms. One apple orchard has yielded on two years in 7 an account of frosts. None at Frisco <sup>land</sup>



## Reservo

Sept. 1+2. Camped in Mr. William Hamby's pasture a mile north of Reservo, under live oaks, junipers & yellow pines by a good spring. Packed specimens and wrote letters and got supplies for the next trip. Did a little collecting but left most of it for Goldman later.

There are ruins of old pueblos on at least two points in the pasture & others on nearly every point along the valley. Some were only single stone houses, others large groups of houses that have fallen down & have only outlines of the walls. A few holes have been dug in some but they are mainly undisturbed. The town of Frisco stands on one of the large ruins, but a smaller and less flattened mass stands on a point a quarter of a mile

Up San Francisco Mts.

Sept. 3. Left Reserve and followed up Canyon Bonito due west to the foot of the mts. + then out over a mesa + up a steep slope to the top and camped on top of main ridge about 6 miles east of Huma. Aneroid at Reserve read 6200, where we left creek 8 miles west 7300, top of timbered mesa 7500 to 8000, top of ridge at camp 8600. From camp I climbed the highest ridge in the vicinity, about 500 feet above, but forgot to take barometer.

Practically the same set of plants + birds + mammals occupy these cuts. as the Mogollons, and the zone limits are essentially the same.

Upper Sonoran zone covers the foothills up to about 7000 feet on open places but extends up to 8000 on SW slopes and even to 8500 on steep rocky SW slopes. It is characterized by *Pinus edulis*, *Juniperus pachyphloea*, *monosperma*, and a few trees of the large berried juniper — by *Quercus arizonica*, *Juglans major*, *Cercus parvifolius*, *Garrya*, *Rhus trilobata*, *Yucca baccata* + *glauca*, *Opuntia schottii* + a flat *Opuntia*.



## San Francisco Mts

Transition zone begins on the uplands at about 7000 feet on N.E. slopes, but extends down along stream bottoms mixed with upper Sonoran. *Pinus ponderosa* & *Populus angustifolia* run down to Reservoir and down the Frisco Canyon far below.

On S.W. slopes *Pinus ponderosa* begins at about 8000 feet (except on very steep slopes) and extends to the highest peaks, a little above 9000 feet. On the N.E. slopes it is replaced by *Abies* Canadian zone species above 8000 except where the slopes are very steep. *Robilia neomexicana* & *Quercus gambeli* have the same ranges as *ponderosa* while *Pseudotsuga* & *Pinus strobus* overlap the upper part of Transition. The little *Ceanothus* & *Berberis repens* are abundant in Transition.

Canadian zone covers the steep N.E. slopes of the Mts. from about 8500 to the tops, running down in steep gulches & disappearing from slopes that are gradual. It is marked by *Abies concolor*, *Populus tremuloides* and a mixture of *Pinus strobus* & *Pseudotsuga*.

## To Luwa Valley.

Sept. 4. Hunted over the Mts. all of forenoon and climbed the highest peak to the north of the trail, only about 8800 feet. The lowest notch in the Mts. south of the San Francisco River Canyon is about 8500 feet until beyond the long ridge lying south of where the trail crosses. Canadian zone is not very strongly marked or pure even on cold slopes, but it follows down gulches to below 8000 in steep rocky places.

The trail continues west along the top of long ridges and then drops down a long steep slope to near the valley floor. It has been built by forest rangers and most of the work has been in blazing trees. Almost every tree near the trail and often 5 or 6 in a group are blazed on both sides deep into the wood and for a space 2 to 4 inches wide and one to 2 feet long with a deep notch cut in above. On a small tree half the circumference is blazed & thousands of thirsty young pines are reared.



## Zuma Valley.

At Camp the aneroid read 8600 at Zuma Valley 7500. at camp at upper end of valley, a mile west of P.O. 7400. Zuma Valley is some 2 miles wide and 4 miles long, probably an old lake bed, with high rimrock on the north, and forested slopes on south and mountains on east & west. The level open part contains half a dozen ranches where grain and a few vegetables are raised, but many old fields are abandoned.

Except a narrow rim of Upper Sonoran, blue oaks, junipers & nut pines along the northern rim high above the valley. The whole valley is transition. Groves of big yellow pines grow scattered over the valley & narrow bands of cottonwoods extend along the river bottoms.

*Aureus gambeli* grows along the edges of the valley and a few boxelders on the flats. A yellow *Senecio* weed covers the valley with a robe of the light yellow. *Artemisia frigida* is abundant.

## Zuma Valley

Sept. 5 & 6. Remained at camp trapping up the canyon but without much success. Found some bear signs, plenty of coon & fox & cat & coyote tracks & a mink track, but could not stay long enough to begin catching them. Got plenty of small stuff, *Neotomas*, *Microtus mogollonensis*, 3 species of *Peromyscus*, chipmunks, ground squirrels etc. & 2 species of bats.

Sept. 7. Broke camp and struck west at the Springerville road, up over high ridges to 8400 feet then on the same level to Bush Valley, where we came close to the south side of the Escudilla Mtn. and decided to go up it, so turned north & camped in a gulch on its north side at 9000 feet. at a little spring.

Came through transition zone forest all the way with yellow pines and a few Douglas spruce & Gambel oak. On the lower hot steep slopes there were still blue oaks & junipers up to about 8000 feet.



Escudilla Mtn.

Camped about noon and started up the mountain at once riding up the trail to the great open grassy park on the first peak at 10100 feet, here we parted, Hotchkiss swinging around in the spruce & aspen woods to hunt bear and Birdseye & I striking across north to the higher peak, and reaching the main part at 10800 feet. There is still a higher peak to the north that must be fully 200 feet higher, but we had not time to reach it. Spent all the time we could hunting bluegrouse through the spruces but did not find any. These Mts. are two old craters with circular rims, and are formed of lava, as are <sup>almost</sup> all the rocks of this country. They are steep and rough but a good trail goes up the stream of the first mountain & then across about 2 miles of beautiful grassy parks to the second. This flat part has several small lakes & numerous streams & springs flowing N.W., probably to the Nutriosa. Dense Canadian zone forest covers all the upper part above 9500 feet.

on southwest slopes and above 9000 feet  
on N.E. slopes or in gulches (or  
lower, as we did not go below 9000 feet).  
The zone is marked by *Picea pungens* &  
*englemanni*, *Abies concolor* & *arizonica*,  
*Populus tremuloides*, and in part by  
*Pseudotsuga* & *Pinus strobus*.  
Also by *Juniperus communis*, *Salix*  
*cordata*(?), *Ribes* <sup>hispidum</sup> & *cereum*(?),  
& numerous small plants.

Transition zone runs up to 9300  
feet on SW slopes but stops below  
9000 on N.E. slopes. It is mainly  
*Pinus ponderosa* & *Quercus engelmannii*  
with a mixture of *Pseudotsuga* & white  
pine at the upper part.



To Nutrioso Arizona

Sept. 8. Broke camp and came back into Bush Valley, and west thro Alpine and over the pass to the Nutrioso and down to Nutrioso<sup>town</sup>, about 3 miles west and camped on mesa. Aneroid at morning camp 9000, at Alpine 8600, at Summit 9100, at Nutrioso 8400, at camp on mesa 8500.

The ~~western~~ northern part of Bush Valley is largely settled & cultivated in a careless way, in such crops as marsh hay, oats, wheat, potatoes & vegetables. Some of the fields are irrigated & others not. Many old fields are abandoned & the fences torn down. The houses & people seem poor and slovenly. Stock raising is the principal industry & grass is plentiful & good. There is lots of water and the valley soil is rich and heavy, but the climate is too cold for successful farming. The valley is all Transition zone and the west end close to the edge of Canadian.

Heavy yellow pine timber surrounds the valley and makes beautiful open forests. Much has been cut for log fires & for building but none remains.

A high, steep lava ridge runs all along the south side of the valley & continues west into the White Mts. Its steep north <sup>side</sup> slope is pure Canadian gone to the base, covered with dense forest of spruces, firs & aspens.

At the west end of Bush Valley we turn north & follow up a small creek between the Escudilla & White Mts to the pass at 9100 feet, then down a long gulch to the Nutriosa Creek. Both Canadian or cold slopes & gulch bottoms and transition or hot slopes go through this pass. Both Canadian & transition species have free access through the pass.

Down the long gulch from the Summit to Nutriosa Creek it is transition gone yellow pine & Gambel's oak forest on the warm slope and Canadian spruce & aspen on the north slope.

On Nutriosa Cr. the valley is transition, ~~to~~ but a tongue of higher Sonoran runs up the steep south slope of the valley wall about 2 miles above the town of Nutriosa. ~~see~~ This is marked by nut pines, *Juniperus pachyphloea* & *monosperma*.



At Nutriosa the valley is mainly transition with upper Sonoran species on warm slopes. Besides nut pines & junipers on the slopes the bottoms are covered in places by *Helianthus annuus* "Helianthella", Cleome etc, but more of it by *Bigelovia* & *Artemisia frigida* & other transition zone species.

A mile below Nutriosa we turned west across the valley & climbed onto a mesa 100 feet above & camped under juniper trees.

The farming along the Nutriosa Valley is mainly grains, wheat, oats, rye etc. Crops are good but weedy & neglected generally. Most of the fields are irrigated. The soil is rich, heavy lava adobe with enough mixture of sand to make it workable.

The whole country is lava overlying sandstone, which latter crops out here & there along the sides of the valley.

Springerville Ariz.

Sept. 9. Continued across mesa west to a creek that runs down to near Springerville & followed down this to the town. Got supplies & visited the Forest Supervisor Warren? & the photographer & trapper, Clay Hunter. Then I crossed to west side of the Little Colorado & followed up its valley on mesa about 12 miles to edge of mountain timber & camped after dark. Aneroid read 7500 at Springerville - 500 ft too high - <sup>at 7000 ft higher got camp</sup>. The dry flaps & south slopes about Springerville are upper Sonoran zone, but cold slopes down to near the town and the wet bottoms seem to be Transition. Nut pines & both junipers cover the foothills and the valleys are a golden glow of *Helianthus annuus*, "*Helianthella*", *Crassia grandiflora*, *Gutierrezia*, *Bigelovia canescens* & small green *Senecio* "*trilobata*", etc. Along the river bottoms is willows, narrow leaved cottonwoods, etc. There are extensive wet marshes & flat fields of grass or grain.



The whole valley bottoms are in fields of grain & hay. Little else is raised except vegetables. There are a lot of peach, apple, plum & cherry trees in town, but the people say they get fruit once in about 7 years. Late frosts kill the young fruit. Last spring a hard frost about June 3 killed all the fruit. They say the spring is early & warm even in February, & trees start too soon. If they could be kept back, as one woman said they did one year by heaping snow around each tree, a good crop could be raised.

Sheep are the principal stock & industry of the country. & they are wintered all around here in the valley. Snow rarely gets deep or lays very long & the sheep are run on the slopes & rims. I never before saw such gramma grass, knee high and over much of the country a ton to the acre could be mowed. The sheep have not come down into the valley yet, except west of the river

where we passed 4 or 5 big flocks of  
about 2000 each. Even here they  
had not eaten the heads of the gramma.

The whole valley & surrounding  
country is lava, and craters, big &  
little are seen on all sides.

In going up the river valley we passed  
5 or 6 beautiful craters, some of low  
lava craters

of steep cones  of lava & cinders.

On the mesa it is all transition  
zone again & the little canyon  
where we camped is full of openings.

This is a lava code box canyon about  
fifty feet deep.



To Camp on Little Colo at 8500 feet.

Sept. 10. Continued over open yellow pine mesa about 5 miles to where we strike the Little Colorado River at a mile or two below Greer, then up about 2 miles above Greer & camped in the canyon at about 8500 feet, on the yellow pine slope. The opposite slope (NW) is aspen, spruces & firs from top to bottom. The canyon here is about 600 feet deep with steep sides & narrow bottom. The Creek is a roaring stream just too big to jump across & heavily fringed with Alders & willows. A little open slope gives us a beautiful camping place with good Canadian goose trapping ground along the stream & at the cold slope.

Reached camp before noon & worked on reports till time to set out traps.

## Up White Mtn. Peak

Sept. 11. Left Birdseye to go to traps & finish bird report & started early in morning for the peaks. Climbed out of canyon on east side & followed mesa about 10 miles south, then up ridge about 5 miles west to top of Thomas Peak at 11280 feet. Did not have time to go over to Old peak, still 3 miles farther west & about 200 feet higher, but Thomas peak is sharper & rougher with more of a timberline on cold slope. Found it an easy climb & could have ridden a horse to the top if I could have gotten him out of the canyon at camp. Found the distance greater than I expected & did not start down from the peak until 4:30 P.M. so did not try to get back to camp. Spent the night in an old burning on the lower slope of the mountain at about 9500 feet. Made a bough bed against a log & kept a fire burning & slept by spells all night.

Found little sign of game and the forest and mountain top are extremely lifeless for such ideal conditions. Grass is abundant in



Found a little chipmunk like  
Eutamias amoenus on the very top  
of Thoros peak & got 2 specimens.  
Saw no more. Also got 2 Picoides  
& a female blue grouse, all good  
records.

the parks and open & on peaks, but the  
woods are carpeted in great part by the  
little blueberry (Vaccinium cespitosum?).  
Generally this has little fruit, but at about  
10 000 feet there were a few ripe berries  
as well as a few ripe strawberries.

Lower down in the burns there were abundance  
of red raspberries & spiny gooseberries,  
and the striped blue currants & the little red  
gooseberries (R. oxycanthoides) run to the peaks.

Sheep are the principal stock in  
the mts. but there are not enough to eat  
half the grass this year. The big mesa  
parks from 9000 to 9500 feet cover miles  
of country & are still ~~knives~~ deep in grass.  
They are full of little lakes & streams  
and every bottom is now full of water.  
There are lots of trout in the streams  
& the ducks are coming into the  
ponds. I counted 35 mallards <sup>132</sup> & 3  
greenneg teal <sup>139</sup> in one small cove.

There are no ranches on these  
mesas except farther east where  
some could be seen in the distance.  
The grassy parks are all in Canadian  
zone & surrounded by aspen, spruce &  
fir timber.

## Back to Camp

Sept. 12 Hunted all the way back to camp but found little save a flock of Blue<sup>297</sup>grouse. Got 2 old males which with the ♀ shot yesterday from the same flock makes good start on a series.

At Camp found Hotchkiss had killed 3 turkeys & brought in 35 fine trout while Birdseye had a fine lot of *Microtus monticola*, *Eutamias*, *Neotoma pallax*, *Peromyscus rufinus* & 2 *Sorex* & half a dozen pine squirrels & a chipmunk. Was hungry & big weary when I reached camp, having tramped about 30 miles with only a small lunch to serve for 3 meals.

Sept. 13 to 15 - Remained at camp, trapping, making up specimens and writing reports. Hotchkiss kept us supplied with trout and our turkeys<sup>310</sup> and grouse collected for specimens furnished plenty of delicious meat. The horses fared equally well as the warm slopes of the canyon are covered with a large *Vetula* loaded with ripening fruit that they are very fond of.



## To Springville

Sept. 16 Had traps to bring in and a lot of skins to make up before starting, so did not get off till 9:30. Got a skunk & the woods cottontail and two *Neotomas* of the pinetum? group.

Came back over the same old road to Springville and camped in town to ship specimens.

Sept. 17 Got a late start (10:30) and came down the St. Johns Road as far as Las Tusas, (23 miles) and camped by the Little Colorado at about 6000 feet. Came all the way over lava fields and among old craters. Good grama grass and lots of big birds of sheep! There are many sinks & basins and reservoirs full of water but no small streams. The Little Colorado runs in a deep lava canyon until it opens out at Walnut Grove and still more at Las Tusas where the road goes down into the river valley to the sandstone levels below the lava cap.

To St. Johns

Sept. 18. Birdseye caught 3 *Neotoma lepida*  
+ a *Peromyscus truei* + *texensis*. + shot  
*Lepus arizonae*. We saw *Citellus grammurus*  
and lots of *Cynomys gunnisoni* + tracks  
of *Perodipus*. I had reports to finish  
+ letters to write for mail at St. Johns.  
Got off at 9:30 + reached St. Johns at 1  
Got supplies and camped 3 miles  
below town on east side of river  
+ got out all the traps we could before  
dark. Camped in typical badlands,  
a part of the Painted Desert and  
slept on fossil beds among bones  
of *Sauropus*.

The river valley, grows wider below  
Las Vegas and at St. Johns is a  
broad farming valley with extensive  
fields of grain and alfalfa + corn and  
sugarcane (*Sorghum*). The soil is rich  
gumbo but poorly cultivated + crops  
are not very good. Fruit trees  
grow in town, lots of peach and apple  
+ pear trees but little fruit.  
Apples and pears are shipped in from  
Concho where there is more fruit  
this year.



The whole valley from Springville  
 to St. Johns and below is Upper  
 Sonoran zone, with juniperus monosperma  
 on the hills, wide leaved cottonwoods  
 at a few places along the river, lots  
 of *Forestiera*, *Atriplex canescens*,  
*Eurotia lanata*, *Lycium pallidum*,  
*Croton texensis*, *Chama integrifolia*,  
*Helianthus annuus* & *linearifolius*? *Helianthella*  
*Gutierrezia*, *Bigeleobia*  
*Cressina grandiflora*, *Yucca glauca*  
 and other species of the zone.  
*Covania nuphar* and *Dalia sp.* were  
 found on rocky slopes at Las Lunas.  
 Cockle burrs, *Argemone*, *Mentzelia*,  
 a little flat *Opuntia* & a low *Cylindropuntia*  
 are common.

## To Zuni River

Sept. 19 Caught 3 *Reithrodontomys* & had  
 2 *Neotoma* to make up for last night, so  
 did not get off till 9:15. Followed the  
 main road N.E. over ridge and down to  
 Carrizo Creek, across the valley and  
 over another ridge & down to Zuni  
 River valley, and camped on north side  
 two or three miles below the Windmill.  
 Came about 15 miles from St. Johns.  
 Camped early and set out a lot of traps.  
 The lower part of both Carrizo and  
 Zuni valleys are typical Painted Desert  
 with bare badland slopes & buttes in  
 strata of rainbow colors. Fossil bones  
 are abundant over the surface in  
 places and fossil logs are numerous  
 in others. At about 6 miles out  
 from St. Johns the road crosses  
 a petrified log 3 or 4 feet in diameter  
 & extending along the surface in broken  
 sections for 40 or 50 feet. Others  
 are scattered over the same slope  
 which leads down into the Carrizo  
 valley. The Zuni river where we  
 camped had great boulders of petrified  
 wood in the channel & small pieces  
 are scattered over the ridges.

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The whole country is Upper Sonoran zone with junipers on the ridges and *Atriplex canescens* and *confertifolia* on the flats & hot slopes, a few *Sarcobatus* bushes along the Zuni R., *Eurotia lanata*, *Artemisia filifolia*, blue *Ephedra*, *Croton texensis*, *Chenopodium integrifolium*, *Helianthus annuus*, "Helianthella" *Bigelovia canescens*, & green hoppers, a low *Cylindropuntia* and a small flat *Opuntia* and on hot slopes a very rank odorous *Salsola* are common plants.

The deep channel of the Zuni River is usually dry but we found pools of good water in the pot holes at deep bends. Grass is good on the ridges and abundant over the valleys but mostly saccharine & poor kinds. There is little stock in the country & the unusual amount of rain this season has given the grass a great boom.



## Up Zuni River

Sept. 20: Caught 2 species of *Neotoma*,  
a *Reithrodontomys* (not *neoblotus*) 2 *Onychomys*  
*pollicens*, 1 *Thomomys* *alpinus*,  
Failed to get a *Perodipus* or *Perognathus*  
as both refused to touch bait.

Stopped to make up 8 mammal skins and  
did not get off till 9:15.

Followed up the Zuni valley past the  
Windmill & Deer Spring, both abandoned  
ranches, and on to beyond the New  
Mexico line, & camped on the big open  
valley above the canyon. For 8 or 10  
miles the river valley canyons up with  
high sandstone mesa on the north and  
a lava capped mesa on the south,  
both covered with junipers & nutpines.  
The valley bottom is flat and the river  
channel deep with cut banks and most  
of the way dry except a small stream  
through the rocky part above Deer Spr.  
This is springy in places & the water is  
alkaline. The pools where we camped  
are also very alkaline, the remnants of  
floods. The valley is Upper Sonoran all  
the way and also the mesa tops. At Deer  
Spring 4 or 5 yellow pines grow on south edge  
of mesa, but no others were seen even to

cold slopes. A few dwarfed *Populus*  
*angustifolia* grow at a springy place in  
canyon and at an old ranch above the  
canyon. Junipers & nut pines cover  
the mesa tops both sides. Foresting  
and a big *Berberis* are the main shrubs  
in the canyon. *Bignonia canescens*  
grows very large & a dark twisted barked  
one & the leafless one are abundant,  
also *Gutierrezia*, *Helianthus*, "*Helianthella*",  
*Chamae* & *Croton* go all up thro the canyon.

There are lots of *Neotomas* & *Perodipus*  
signs but not a *Thomomys*. A hill was  
seen till we camped at night when  
the hills of one were found & the gophers caught.

Got in camp in time to set out  
a line of traps. Found a dead  
porcupine near camp & saved  
the skull, also a badger.



## To Zuni

Sept. 21. The alkali water made both Hotchkiss & Birdseye sick so I had to get breakfast & then eat most of it. Got *Perodipus longimembris*, *Thomomys*, & *Onychomys*. Birdseye made up 3 skins and we got started at 8:30. Followed the only traveled wagon road about 6 miles to Ojo Caliente, a poor little pueblo along the sunny side of a hill. Then turned north to Zuni, about 12 miles. Got grain at the store and went up to a spring near the big Zuni Dam and camped. In going around by Ojo Caliente we left the river valley but came into it again below Zuni. It is a wide, level plain, of good soil but somewhat alkaline. It is mainly covered with seedless grass *Atriplex canescens* & some *Sarcobatus*, lots of *Begonia canescens* & leafless & dead green twisted leaf form, *Gutierrezia*, *Croton*, *Chenop*, *Solanum* (blue), *Helianthus*, "Helianthella", and in places a rank swelling *Dalea*. Two or three large cottonwoods & a wide leaf form grow along the stream below the pueblo & one on a side gulch above.

Over the ridges and mesas on all sides of the valley are juniper & nut pines but only upper Sonoran plants between.

Grass is generally poor, owing to overgrazing with sheep. Below Gila County sheep corals dotted the hillsides as this is winter range. Only one small herd was seen however on the trip.

The big dam & reservoir above Zuni is going to make a rich farming valley for these people. The land lies well & if there is water enough the valley can be irrigated for 15 or 20 miles and one to 4 miles wide.

The one big ditch runs along the west side of the valley, on north side at Zuni and is 10 to 15 feet wide on the bottom and 2 to 6 feet deep. It is just completed but has not been used. The *Perodipus* seem to think it was built just for their winter quarters and they come from far & near to occupy the banks. They burrow in near the base and go straight back

and hundreds of their burrows enter the lower bank of the ditch.





Thompson also gathers along the ditch but burrow more in the upper bank where the only damage is in filling up the ditches. Many also burrow in the lower bank where they are sure to pierce the wall. Perognathus, Onychomys, and numerous other little burrows appear in the banks and by time to time the water in next spring a new ditch bank will be needed. Some one ought to get busy with a line of poisons along the ditches.

The Indians at present raise little fields of corn & squashes <sup>+ pump</sup> here & there all over the country without irrigation. Any little sandy flat where soil is good & the water will stand after a rain is dug or plowed up & planted & left to take its chance. This year has been unusually rainy & crops are pretty good. Corn that has apparently never been touched has a fair yield of ears. & little patches of squashes in the sagebrush have good fruit. At OfoCiente some little patches of onions & chili are irrigated.

## Zuni to Gallup.

Sept. 22 & 23 - From Zuni we follow a good wagon road almost due north, gradually up onto higher ridges until above 7000 feet where we began to strike a few yellow pines & gambel's oaks, then on up and down gentle slopes over mixed upper Sonoran and Transition zone ridges, then down to about the 7000 foot contour and camped 12 miles south of Gallup. From here we followed down a long gulch that leads off to the west, then over several ridges and reached Gallup at noon, got our mail and some supplies and returned back with on the Zuni road to camp by a big tenaja.

From Zuni to Gallup the country is dry, with only a few places of very poor water, little grass, few people and no stock except sheep. It is mainly wooded ridges covered with junipers and nut pines almost all the way, well mixed with yellow pines and gambel's oak on the higher ridges and cold slopes. These ridges are the western end of the Zuni Mts. which rise black and forested just east of us.



At our camp 12 miles south of Gallup we caught *Neotoma*, *Peromyscus truei* & *texensis*, *Perodipus montanus*?, *Perognathus*. We saw *Eutamias dorsalis*, *Citellus grammurus*, *Cynomys gunnisoni*, *Lepus arizonae* & *texensis*, *Erethizon* quairings and heard coyotes. The small alkaline stream where we camped is barely drinkable but this seems to be a great winter.

Sept. 24-27 - Remained at our camp near Gallup writing reports, shipping specimens, making out accounts and collecting. Weather windy and squally with showers until the 25, Froze hard ~~ice~~ half an inch thick the mornings of the 26 & 27 but clear and pleasant days.

Sept. 28 - Got supplies and started for the Chuska Mts. Camped about 2 miles beyond Rock Springs on the road to Ft. Defiance. Came about 14 miles. Camped near some little lakes, or rain ponds of fairly good water. No change in zones or species from the valley at Gallup. All upper Sonoran.

To Ft. Defiance, Arizona

Sept. 29. Caught 3 fine big *Dipodomys* *opretabilis* and an *Onychomys*. A *Perodipus* went off with a trap & I lost him. Packed up & started at 8:30 and reached Ft. Defiance, Arizona at 3 P.M. & camped at the agency. Came about 18 miles.

The country is very dry and barren, no grass most of the way, all stripped off and the bushes eaten off by goats. Had to get hay at the agency store.

It is all Upper Sonoran zone, with nut pines & junipers *monosperma* on the ridges and *Atriplex canescens* and *Sarcobatus vermiculatus* in the valley. Helianthus annuus and Cleome grow where not eaten off by sheep. ~~Saw 4~~

Transition zone shows in yellow pines along the top & cold slope of the big mesa west of the Arizona line and on the big mesa east of Ft. Defiance. A lot of scrubby yellow pines grow on a bare rocky south slope of a ridge 8 miles SE. of the Agency but grow there from some abnormal reason.

Saw 4 coyotes & heard lots more. Saw a few *Cynomys gunnisoni* & one rock squirrel.



## Up Chusca Mts.

Sept. 30. Left Ft. Defiance and followed north up the Benito Valley about 6 miles then turned east up a canyon between high red sandstone cliffs and followed it back on top of the mesa to its very head, then over into other draws and across flats and ridges, N.E., and camped at a spring 2 miles NW of Chidaxi peak at about 8000 feet.

The Mts. are sandstone mesas cut up into canyons and plateaus. Out above 8000 feet on SW & 7000 on NE slopes they are Transition zone, open yellow pine and Gambel's oak forest & *Pseudotsuga* on cold slopes. They are rather dry with a few springs and small streams at long intervals. The grass is good in places but has been mostly eaten off by sheep & goats. The Navajos have numerous hogans near the water places & run their sheep far back over dry ridges. They have now mostly left the mts. as the grass is drying up & it is getting cold & frosty. A few occupied houses and camps were passed & a few small herds seen.

Chusea Mts.

Oct. 1. Remained at camp all day making up specimens and hunting & setting traps. Went to top of high mesa point just north of Choister Peak and got a good view of the country, colored in gone map and picked out trail to high mesa to north.

Found *Aspens* and *Juniperus communis* and *Lepidogyraca canadensis* on north slope and heard a *Sciurus mogadonensis*, all at about 8500 feet, a strong trace of Canadian zone.

Most of the mountains are Transition zone open yellow pine timber with Gambel's oak on rough slopes.

Upper Sonoran nut pines, *Juniperus scopulorum* & *monosperma* & *Arceuthobium* <sup>SW.</sup> *parvifolius* come up on steep rocky slopes to above 8000 in places.

The Navajos have left the mts. with their sheep but recently. There is little grass left. Hogans are seen everywhere within reach of water. Some Siuegas are fenced in for water and horse feed, but corrals are found on all sides for the sheep and usually a summer camp, or Hogan by each corral.



Chusea Mts. & Lakes

Oct. 2. Packed up and started N.E., climbed onto a long flat topped ridge and followed it until it joined the main high mesa and then follow good trail 2 or 3 miles N.E. through open, clean forest of fine yellow pines to the first lakes. After passing 2 lakes we struck a shallow gulch leading off to the south and camped in it by some waterholes at about 8500 feet in a grove of aspens. It was cold and windy and we found this gulch well protected and the most comfortable spot available. Camped about 10 A.M. & Camped about 8 miles. Set traps up and down the gulch and shot some specimens. Grass is short but the horses get enough while not working.

In P.M. I rode over past 4 or 5 more lakes to the N.E. and out to edge of the high mesa escarpment of the Chusea Mts., overlooking the great barren desert of the Chusea river valley. The wind was blowing a fierce gale so I could hardly ride against it & the desert was all dense with dust.

## Chusea Mts - Mammals

### Odocoileus

no signs seen.

*Sciurus aberti*, ~~com~~ in yellow pines

" *noveboracensis* " in spruce gulches

*Callospermophilus lateralis*, ~~com~~, One caught  
& several seen up to Oct. 4. very fat.

One ran down a yellow pine & had its  
chucks full of pine seeds.

*Eutamias* *tristatus*? ~~Com~~ in yellow pines,  
climb trees

*Peromyscus rufinus*, ~~com~~

" *sonoriensis* "

*Neotoma pallax* "

*Microtus mordax* "

*Cynomys gunnisoni*, ~~com~~ in spots to 9000.

Indians driven em out.

*Thomomys fossor*, ~~com~~ at 9000 - in woods

" *apache* " " around lakes.

\* " *aureus*? 1 taken at first camp, about 8000.

*Lepus halversoni*, ~~com~~ 7500 to 9000. 2 taken.

*Erethizon epixanthus*, ~~com~~. 3 taken ♂, ♀, & yg ♀.

*Neotoma* Tracks seen in low canyons

*Canis latrans*, ~~com~~. 1 taken.

*Taxidea* " dig out *microtus*,

*Thomomys*, *Cynomys* & *Callospermophilus*.

*Mephitis*, a few tracks & holes

*Elasmus americanus*, old signs, said to be here.

Outkilled near Window, below Agency.

## Chusea Mts.

Oct 3. Still windy and cold and  
a little snow flying most all day.  
Set Coyote and gopher traps up by the  
lakes and hunted in woods.  
Got a wallard & big squirrel & saw  
turkey tracks and porcupine dens.

Oct 4. Clouded off without storming but  
had a very cold night, heavy frost &  
thick ice. Warmed up with the sun  
and had a pleasant, quiet day.

Caught 3 porcupines, 2 species of  
*Thomomys*, (*fossor* & *apache*) *Microtus*  
*monticola*, *Eutamias quadrivittatus*,  
and Belders got *Neotoma pallax*,  
*Sciurus noveboracensis*, *Eutamias*,  
*Microtus* & *Peromyscus*. A Coyote  
howled around camp nearly all night  
but did not find my traps up by  
lake. Set a few more traps.



Oct. 5. Caught a coyote and a few more  
Thomomys. Took up small traps so  
as to be ready to start in morning.  
A very cold night, 2 or 3 inches thick,  
slept cold in spite of fire in front of tent.

Explored mountains and found a lot more  
lakes. Shot 3 wallabies in one deep  
lake that did not freeze over. Bluebirds  
were feeding on the ice of lakes.

Oct. 6 The horses scattered out and sneaked  
off and hid in 3 different directions so  
we had to track up each bunch and did  
not get them all till noon.

Then packed up and traveled north  
over top of the mountain plateau  
past the big lake and beyond to  
where the big trail crosses to Shup spring  
on the east. Here we found wolf tracks  
so camped & set out traps.

Came about 12 miles over level, open  
yellow pine forest country past  
dozens of little & big lakes that occupy  
almost every basin. Aspen forests  
cover all north slopes and fill the gulches.  
 Gambel's oak is abundant on rocky  
crests & ridges and steep slopes.

*Pseudotsuga* & *Pinus pungens* grow north with aspens

Chusea Mts.

Oct. 7. Continued north along top of plateau over same kind of country and at about 8800 to 9000 feet. Passed half a dozen large and small lakes until we came out on rim of deep canyon with wagon road in bottom that crosses the range in deep notch. Couldn't will get down to road so camped at a little lake with fresh turkey tracks all around and set traps. This north end of the range has long steep slopes covered densely with *Aspens* and *Picea pungens* and *Abies arizonica* along the stream gulches. There is a more extensive area of Canadian zone here than at the south end of the range where it appears only on local cold slopes in bends of canyons or north sides of ridges.

From just north of our last camp a high ridge of lava rock runs along the east crest of the range, deeply overlying the horizontal sandstone mesa. This reaches its highest point where it drops abruptly to the notch through which the wagon road passes.



Oct. 8. Hunted turkeys in morning but did not find any. In P.M. took a horse and went down to road in canyon and up the range north of it, the Teneba Mts. if the wagon road is correctly located on Contour Map. This range is largely volcanic and very rough in great black buttes and ridges on the same old sandstone mesa. There are huge buttes and cliffs of black basalt and deep rough canyons. In places the sandstone forms the floor of level valleys between the ridges.

The range is on a level with the Chuseas, 8500 to 9000 feet generally. It is generally the same with the same trees. Transition yellow pine & Gambel oak forest over the flat part & south slopes. Aspen & spruce & fir on the higher cold slopes and in cold gulches. It is ever baser and more sheeped off than the Chuseas, as the stony slopes have but little grass to start with and this is soon destroyed.

## Chusea Mts. down to Crystal

Oct. 9. Started down the wagon road to go to Ft. Defiance for mail but 8 miles down discovered the town (or subagency) of Crystal with good store, post office & daily mail. So sent down to Defiance (25 miles) for our mail, got what supplies we needed and came back to camp. Crystal is about 2 miles east of Red Lake, (called Black Lake on the map) a large body of water in the valley. No one in the country ever heard of Black Lake. Our camp is at Cottonwood Pass, the only pass with a good road across the Mts. they say. From the pass it is about 45 miles to Fruitland.

I found Transition zone down close to Crystal and even beyond on cold slopes. There are strips and ridges of yellow pines scattered over the valley, where ever the slope changes from warm to cold. On the warm slopes and flat part of valley are upper Sonoran, either open or covered with nut pines and junipers. These extend just into the canyons on steep hot slopes, while Canadian zone appears & spruces run half way down the road canyon on cold slopes.



A few *Populus angustifolia* down near mouth of canyon probably give the name Cottonwood to the pass.

A few Indians live in lower end of canyon and one family have sheep & goats up a mile in the canyon. At this place an Indian was taking a sweat house bath with hot stones in water in a clay oven. These sweat houses are seen by every lake and stream & spring & pool all over the mts. & seem to be much used.

The Indian who was attending to the sweat house and talking to some one inside was entirely naked and as finely formed a man as one often sees, with heavy chest & shoulders, slender waist & good limbs.

Oct. 10, Hunted turkeys <sup>310</sup> most all day but did not see any, the tracks are numerous. Saw a few bear tracks & Hotchkiss & I each shot a coyote. Birdseye caught one yesterday, making 4 specimens for this range.

## Down to Crystal

Oct. 11, Went down to Crystal for mail and took a short cut across the mts. & down a canyon on west slope. Found this canyon about the same as Cottonwood Canyon only not so wide or long & with a smaller stream. No one lives in it but sheep & goats are herded in the lower part.

Junipers & nut pines come up on south slope into lower part. Robins & Solitaires are common in the juniper and the Solitaires singing jubilantly. Saw a fresh bear trail at head of canyon.

At Crystal the upper Sonoran zone is marked on warm slopes by junipers & nut pines, *Bigelovia tortifolia*, *Lehmannia cuneata*, *Guthriea*, and *Opuntia*. By *Perodipus* & *Aphelocoma*.

It is not very strong or pure.

Oct. 12. Started at noon, passed through Cottonwood pass and down into the second bench, then north 5 or 6 miles and down to the flat of Tunesha Creek and down the creek to the Indian settlement & camped long after dark. Came about 20 miles. And from 9000 to 5300.

From the lower edge of Transition zone at 7000 feet we passed through a belt of Nut pine, juniper (*monosperma scopulorum*) *Artemisia tridentata* & *arbuscula*, *Covania*, *Cercocarpus parvifolius*, *Yucca angustifolia* & *laevis*, *Opuntia* (3 flat & 1 round species).

At about 5500 feet we left the juniper belt & came out onto short grass plains for the rest of way.

Half a dozen big, wide leaf cottonwoods are scattered along the flats & gulches at the Indian settlement, but other vegetation is scarce. *Sarcobatus* and *Atriplex canescens* & *confertifolia* are abundant on some soils.



Rocky Cr - Aug. 23.







